

19980813.ba v02\_n169.bam.980813

>From ???@??? Fri Aug 14 06:10:05 1998  
Message-Id: <199808131530.KAA11364@sco.theporch.com>  
Date: Thu, 13 Aug 1998 10:30:04 CDT  
Subject: BOATANCHORS digest 2169

BOATANCHORS Digest 2169

Topics covered in this issue include:

- 1) re: R392  
by Glenn Finerman <glennfin@mjet.com>
- 2) WTB: Collins 70E-12 PTO  
by "Grant Youngman" <nq5t@gte.net>
- 3) what is this receiver??  
by Kargokult@aol.com
- 4) Re: BAR-BE-QUED TUBES  
by "Arden Allen" <gumbear@pacbell.net>
- 5) Re: Laughing gas in your radio!  
by Bill Jarvis <B.H.Jarvis@hw.ac.uk>
- 6) re: R392  
by "P. J. Rovero" <provero@connix.com>
- 7) Re: Ranger  
by Dan Martin <dmartin@visuallink.com>
- 8) re: R392  
by "Joseph W. Pinner" <kc5ijd@sprintmail.com>
- 9) RE: Laughing Gas  
by Jderm740@aol.com
- 10) How high is "Infinity"  
by Andre Guibert <aguibert@sympatico.ca>
- 11) Inert Gas  
by cswiger <cswiger@wilma.widomaker.com>
- 12) collins  
by luc dugas <collins2@globetrotter.net>
- 13) FS?FT: R-808/GRC-14 Receiver  
by Sandy W5TVW <ebjr@worldnet.att.net>
- 14) 75A3 Hot Transformer -- Post Mortem  
by "Grant Youngman" <nq5t@gte.net>
- 15) FS: Central Elec. MM-1 RF Analyzer  
by "Terry O'Laughlin" <terryo@wort-fm.terracom.net>
- 16) Gassy Tubes  
by mack@mails.imed.com (Ray Mack)
- 17) Re: Inert Gas  
by Jim Garland W8ZR <4CX250B@miaavx1.acs.muohio.edu>
- 18) Ultra Modulation effects Explained (long)  
by mack@mails.imed.com (Ray Mack)
- 19) RE: what is this receiver??

by Ed Sieb <esieb@gmsiworld.com>  
20) RE: Inert Gas  
by "Laudon, Kenneth (Kalman) A." <klaudon@pica.army.mil>

-----  
Message-Id: <199808130340.WAA06219@sco.theporch.com>  
Date: Wed, 12 Aug 1998 23:42:31 -0400  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Glenn Finerman <glennfin@mjet.com>  
Subject: re: R392  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"

I couldn't wait a moment longer to open up the R392  
and have a look inside. I was going to wait for my manual  
to arrive but curiosity took over.....off with the cover!!

The first three words out of my mouth after I got the cover off,,,  
OH MY GOD!!!! ....That gear drive assembly WOW! I can't even  
begin to imagine how that was designed from scratch!! whew!  
My hat is off to 'ol Art Collins for that one! Truly amazing.

After the initial shock wore off I started to take a look around,  
the top and bottom sections...remember I said the meter was  
dead? well, good reason for that.....the two wires that are  
supposed to attach to the meter are just hanging there. Seems  
like Fair (or someone) must have at one time, replaced the original  
meter and never bothered to hook it up. I bet it's dead when I get  
around to hooking it up! I have a strong suspicion it was just put there  
to fill the opening that was left behind when the original radioactive  
meter was removed. (just a guess) after all this is a "used-repairable"  
unit...

Now on to that annoying kilocycle dial binding problem...  
You can see most of the gear drive assembly from either the top  
or bottom, but there is still some that's hidden from view. Removed the  
right side plate and could get a much better view of the gears.  
Quite a bit of old lubrication on the gears which should probably  
be removed but that's not what's causing the problem. Seems when  
you rotate the Kilocycle dial it gets hard to turn in spots, almost  
getting stuck. When looking at the side of the receiver while rotating  
the knob, you can see the front panel flexing slightly back and  
forth. It's either a slightly bent shaft or an alignment problem cauz  
when I take a screwdriver and force the front panel up in the opposite  
direction a bit from the main chassis, hold it there and turn the knob,  
the dial turns smoothly!!! Ah ha!..., (you pegged that one right on the  
money, Mark Blair!!) Well I can see I'll have to remove the front panel  
to really solve this problem so I'm going to put it aside and wait for my

original manual to arrive...

Just one question while I'm waiting....how do you get to the components under the section with the slug cans? Please don't tell me you have to remove that awful slug can assembly just to get at the components soldered to the tube sockets in that section!!  
(like caps and resistors that may need replacing in the future)

AMAZING!!!!

73.....Glenn Finerman K2KL glennfin@mjet.com

...

glennfin@mjet.com (home)  
glennfin@dataprobe.com (work)

-----  
Message-Id: <199808130523.AAA08960@smtp1.mailsvcs.net>  
From: "Grant Youngman" <nq5t@gte.net>  
To: Old Tube Radios <boatanchors@theporch.com>  
Date: Thu, 13 Aug 1998 00:22:56 -0500  
MIME-Version: 1.0  
Content-type: text/plain; charset=US-ASCII  
Content-transfer-encoding: 7BIT  
Subject: WTB: Collins 70E-12 PTO

Looking for subject item in new or otherwise decent condition.

Thanks .... Grant

-----  
Grant Youngman / NQ5T

nq5t@gte.net  
BA pics at <http://home1.gte.net/nq5t>  
Double Oak, TX -- nr Dallas

-----  
From: Kargokult@aol.com  
Message-ID: <a5eead11.35d27828@aol.com>  
Date: Thu, 13 Aug 1998 01:22:47 EDT  
To: Old Tube Radios <boatanchors@theporch.com>  
Mime-Version: 1.0  
Subject: what is this receiver??  
Content-type: text/plain; charset=US-ASCII  
Content-transfer-encoding: 7bit

i took another look at this receiver that stumped the pros last try.

90 kcs - 30 Mcs in 7 bands. dial is on left side and dial eschucheon has rf and mixer trimmer adj knobs at bottom. tuning knob has a large numbered skirt on it. over on right side is built in speaker with speaker opening on front panel as 4 holes about 2 inches each hole, the 4 in a clover pattern. set has IF and RF gain, metal tubes, built in 115 ac supply. not a homebuilt as there once was a nameplate on it. back has only a tag that sez licensed to use patents of ITT. one thing strange to me, is that the dial seems to have markings for the ship HF bands like at 6, 8, 16 Mcs; like " 48 METERS" in the 6+ mcs area. other than that, the only use or interest-indicator on the freq dial is two areas that are marked " POLICE" . odd ! why would this be marked only POLICE, no markings for "amateur", "broadcast" etc. ?? also, where the range overlaps on the HF range, on the low part of the dial it will say for example USE BAND 3 referring you back to the top of the previous band, for better sensitivity, i suppose. ( higher L/C ratio there.)  
no quartz filter or selectivity control.  
looks like standard 19 inch width.  
any ideas ??  
tnx, hue KA7LXY

-----  
Message-Id: <199808130643.XAA29996@mail-gw.pacbell.net>  
From: "Arden Allen" <gumbear@pacbell.net>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: Re: BAR-BE-QUED TUBES  
Date: Wed, 12 Aug 1998 23:45:57 -0700  
MIME-Version: 1.0  
Content-Type: text/plain; charset=ISO-8859-1  
Content-Transfer-Encoding: 7bit

Hi Dave and all;

> I speculate that natural outgassing in long-idle tubes  
> forms a "crust" on the getter deposit. Heating the  
> tubes to near operating temperature for a time  
> breaks that crust and allows the getter to mop-up  
> the gas. Or perhaps the getter chemistry is designed  
> to work at operating temperature and the gas  
> simply accumulates over time.  
>  
> Any opinions from the list?

I read somewhere recently (on this list?) that just running such a tube at moderate plate current for a period of time will reduce the gas as the getter does its job. I'm worried about what happens to the bakelite based tubes when they get roasted in the oven.

Arden Allen KB6NAX Vallejo, CA gumbear@pacbell.net

-----  
Message-Id: <199808130905.KAA01273@punt2.hw.ac.uk>

MIME-Version: 1.0

To: Old Tube Radios <boatanchors@theporch.com>

From: Bill Jarvis <B.H.Jarvis@hw.ac.uk>

CC: boatanchors <boatanchors@theporch.com>

Date: Thu, 13 Aug 1998 10:05:25 +500

Subject: Re: Laughing gas in your radio!

> I was so certain that my humourous "suggestion" to use nitrous  
>oxide to purge-and-fill a radio would be plainly seen as a joke,  
>that I didn't bother putting the smiley at the end of the  
>sentence! Now as far as CO2 goes, it was just an idea - I have

snip

Perhaps nitrous oxide is the substance responsible for such arcane effects as chassis color, rectifier-tube pedigree or a few microns of gold wash on connectors handling infinitesimal power making a suitably configured audiophile amplifier sound perceptibly better.

snip

I was surprised to discover that whipped cream (real cream, not the substitute) is "propelled" with nitrous oxide. I wonder why? Make for better parties?

=====       =====       BILL J.       =====       =====       =====

GM8APX, qthr

Edinburgh, Scotland, UK

Seda te, catule bone!

Net-Tamer V 1.11 - Registered

-----  
Date: Thu, 13 Aug 1998 07:58:05 -0400 (EDT)

From: "P. J. Rovero" <provero@connix.com>

To: Old Tube Radios <boatanchors@theporch.com>

cc: Old Tube Radios <boatanchors@theporch.com>

Subject: re: R392

Message-ID: <Pine.BSI.3.95.980813075329.21732A-100000@comet.connix.com>

MIME-Version: 1.0

Content-Type: TEXT/PLAIN; charset=US-ASCII

Glenn et all,

One problem with "modular" radios like the R-39X series, FRR/MRR/SRR series, R-1051 etc., is that some components are only accessible with the modules removed from the radio.

Makes it very tough to test these components "live".

In their intended operating environments, a spare radio or spare module would be readily available, and the broken one would go back to an intermediate level for repair. Some of the troubleshooting techniques even relied on module swaps....

For the typical BA-member who's cut off from DOD logistics support, it means you have to be creative....

P. J. "Josh" Rovero	email: <a href="mailto:provero@connix.com">provero@connix.com</a>
Oceanographer	work: <a href="mailto:rovero@sonalysts.com">rovero@sonalysts.com</a>
Meteorologist	radio: KK1D
Curmudgeon at Large	web: <a href="http://www.connix.com/~provero/">http://www.connix.com/~provero/</a>

-----  
Message-ID: <35D2D46F.2DAE@visuallink.com>  
Date: Thu, 13 Aug 1998 07:56:31 -0400  
From: Dan Martin <[dmartin@visuallink.com](mailto:dmartin@visuallink.com)>  
MIME-Version: 1.0  
To: Old Tube Radios <[boatanchors@theporch.com](mailto:boatanchors@theporch.com)>  
CC: [boatanchors@theporch.com](mailto:boatanchors@theporch.com)  
Subject: Re: Ranger  
Content-Type: text/plain; charset=us-ascii  
Content-Transfer-Encoding: 7bit

ROBERT F. KEMP wrote:

>  
> Dan:  
> Check tubes first before presuming the worst. My little ranger arced  
> and  
> found the little 6AL5 was bad (little bias rectifier tube) I got the  
> arcing and kept blowing fuses. 99% of the problems can be tracked to  
> tubes and I think many times we always presume the worst due to the age  
> of these rigs before we check the tubes out!  
> Bob.

Thanks, Bob, for your reply and advice. And thanks to everyone for the  
\*many\* helpful comments I've received. I feel as if I have an army of

technicians working on my little Ranger! Right now, my troubleshooting continues and I'm narrowing the possibilities some. My earlier remark that "the iron looks OK" may not be so. With the front panel function switch in the "phone" position, a setting when everything in the Ranger is enabled (modulators, final, etc.), I get lots of megohms resistance to ground from pin 5 of the rear panel jack. This is the modulated HV output from the mod. x-former to the 6146B and many megohms to ground (essentially open to ground on my Fluke) is good and all downstream stuff from here must be OK. But from pin 6 to ground I get about 20K. Not good. This is the HV line that goes 'round to LP1, the HV choke and back to the center of the primary on the mod x-former. Needless to say, leads on my HV choke, LP1, and the primary of the mod x-former show about 20K to ground. Well, don't know if the mod. x-former primary or HV choke is leaking to ground or if it is a discrete component somewhere in between. Need to isolate each piece of iron and check 'em individually. The mod. x-former secondary is definitely OK. Pins 1, 2, and 3 on the back panel jack are many, many megohms above ground, infinity on my Fluke (at least with the plug removed the secondary is - putting the plug in place with its jumpers will take the mod. x-former secondary down to 20K, too, of course, and spreads the misery considerably). This means the leak to ground is somewhere in the relatively small circuit between pin 6 of the back panel jack, through switch SW4B and the HV choke, and around to the center of the mod. x-former primary. I think the meter may be in this circuit, too. Gotta check. I've already lifted the low side of a couple of possibly-bad caps in this circuit to no effect. This cap lifting \*did\* involve C77, the big HV electrolytic and a primary suspect, and it had no effect on the low circuit impedance to ground. (Too bad. Wouldn't that've been nice!)

Either way, I'll get it right eventually. I've sure learned more about my Ranger in the last week than in the previous three years I've had it. I took possession of it in \*perfect\* plug-and-play condition (cosmetically it is near-mint) and no work was required. Poring over the circuits so much this week has also revealed at least a few undocumented mods in the audio area - a cap or two missing and a cap or two added. Probably not real unusual in Rangers but unknown to me since I've had no cause to open it up 'til this week and I've used it exclusively on cw anyway.

Thanks again to everyone and keep your comments coming. My Ranger shall live again!

73  
Dan  
WB4GRA  
Winchester, VA

-----

Message-Id: <199808131223.FAA24356@raven.prod.itd.earthlink.net>  
Subject: re: R392  
Date: Thu, 13 Aug 1998 07:25:32 -0500  
From: "Joseph W. Pinner" <kc5ijd@sprintmail.com>  
To: Old Tube Radios <boatanchors@theporch.com>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="US-ASCII"

>One problem with "modular" radios like the R-39X series,  
>FRR/MRR/SRR series, R-1051 etc., is that some components are  
>only accessible with the modules removed from the radio.  
>  
>Makes it very tough to test these components "live".  
>  
>In their intended operating environments, a spare radio  
>or spare module would be readily available, and the  
>broken one would go back to an intermediate level for  
>repair. Some of the troubleshooting techniques even  
>relied on module swaps....

This makes a great deal of sense from the military perspective.

It is far more efficient to narrow the problem to a module, and then replace it. You are back up and running in a short time. Plus in the shipboard atmosphere where you often found the particular radios you mention, component level repair is sometimes difficult - weather is often bad and the ship is something less than stationary.

It is not so easy for us, though. However, some of these sets did have extender cables which could be used for in circuit repair. They are not always easy to find, but they are out there. This is true of the R-1051, PRC-41, PRC-47, GRC-106, etc.

73

Joseph W Pinner  
Lafayette, LA  
KC5IJD  
EMail: kc5ijd@sprintmail.com

-----  
From: Jderm740@aol.com  
Message-ID: <9a2809d2.35d2dbf6@aol.com>  
Date: Thu, 13 Aug 1998 08:28:36 EDT  
To: Old Tube Radios <boatanchors@theporch.com>  
Mime-Version: 1.0  
Subject: RE: Laughing Gas  
Content-type: text/plain; charset=US-ASCII



Content-transfer-encoding: 7bit

Hi Gasious Ones

Might I suggest Helium for a number of reasons;

- 1) it's inert
- 2) it's readily available. Every Hallmark store in the country has it to blow up those balloons they sell.
- 3) and after you drag the radio into the store for a charge, it will be much easier to carry home. It also will be a lot easier to move about the workbench.

Jack

-----  
Date: Thu, 13 Aug 1998 08:34:05 -0400 (EDT)  
Message-Id: <199808131234.IAA26131@smtp11.bellglobal.com>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Andre Guibert <aguibert@sympatico.ca>  
Subject: How high is "Infinity"

Bonjour to All  
Was pointed out by a knowledgeable customer that I  
should write "Above" the last scale mark.  
I.E.: Above 200Megs  
Instruments have various upper limits.

-----  
Date: Thu, 13 Aug 1998 08:59:29 -0400 (EDT)  
From: cswiger <cswiger@wilma.widomaker.com>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: Inert Gas  
Message-ID: <Pine.BSF.3.96.980813085150.23152A-100000@wilma.widomaker.com>  
MIME-Version: 1.0  
Content-Type: TEXT/PLAIN; charset=US-ASCII

klaudon@pica.army.mil writes:

>I was so certain that my humourous "suggestion" to use nitrous oxide to  
>purge-and-fill a radio would be plainly seen as a joke, that I didn't  
>bother putting the smiley at the end of the sentence! Now as far as CO2

How about Helium? It's readily available at the local X-mart in the party and balloon supplies dept. I beleive that He is in the inert gas column, plus your 392 would be much easier to carry :0 :) ;]

Chuck  
kb4new  
cswiger@widomaker.com

-----  
Date: Thu, 13 Aug 1998 09:00:17 -0400 (EDT)  
Message-Id: <199808131300.JAA21869@mail.quebectel.com>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
To: Old Tube Radios <boatanchors@theporch.com>  
From: luc dugas <collins2@globetrotter.net>  
Subject: collins

i have a collins frequency shift converter cv89a/ura-8a.i'm wondering if someone have a use for that

luc ve2lgj 73s

-----  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Sandy W5TVW <ebjr@worldnet.att.net>  
Subject: FS?FT: R-808/GRC-14 Receiver  
Message-Id: <19980813130850.YOFJ19652@LOCALNAME>  
Date: Thu, 13 Aug 1998 13:08:50 +0000

Here's a heavy boatanchor for anyone interested! An R-808/GRC-14 receiver in good physical condition and appears to be working. Looks almost new inside! I have absolutely no idea of the value of this beast. I'd like to swap it for "what have you" that might be of interest to me. Pickup only, as this one would cost a bundle to ship! (It weighs around 75 pounds!) Looks like you could drop it off a cliff and it would survive!

It covers about 1.8-32 Mhz in about 6 bands. It is sort of semi-bandspreaded to boot! It takes forever to crank the dial from one end of a band to the other, kinda like a BC-348 twice over. It has a built-in RTTY converter (not tried), and will run from 115 VAC or 24 VDC. I don't have any books or schematics for it.

I'm looking for a Gonset Communicator III for 6 meters that's complete, An "RAL" receiver with or without power supply, or ???

73,  
Sandy W5TVW

-----  
Message-Id: <199808131327.IAA19089@smtp1.mailsvcs.net>  
From: "Grant Youngman" <nq5t@gte.net>  
To: Old Tube Radios <boatanchors@theporch.com>  
Date: Thu, 13 Aug 1998 08:25:59 -0600  
MIME-Version: 1.0  
Content-type: text/plain; charset=US-ASCII  
Content-transfer-encoding: 7BIT  
Subject: 75A3 Hot Transformer -- Post Mortem

Group ...

A few weeks ago I queried the collective wisdom about the seeming extreme heating of the power transformer in my newly acquired 75A3. Not a meltdown situation, but hot enough to cause some worry.

While the responses weren't entirely one-sided on the matter, the majority conclusion was that there was (1) a problem in the receiver causing excessive current draw somewhere or (2) shorted turns in the power transformer.

I took the expedient (and gold-plated) approach and ordered a new transformer from Peter Dahl. Finally received it and finished the installation a couple of nights ago. Replaced the filter caps and meggered each filter choke to its case to ensure there weren't any leakage paths to ground from that source.

Here are the resulting measurements:

Total DC draw (5Y3 cathode to PS filter): 120ma  
6.3VAC filis: 5.8A  
5.0VAC filis: 2.0A  
AC Mains: 0.925A @ 120VAC

Everything is nominal. The HV winding in the Dahl transformer is rated at 150ma CCS. Total filament draws are about right given an extra tube (calibrator), pilot lamps, etc. I compute around 20-25 watts consumed in the transformer itself. That plus the effects of the radiant heat from the hot 5Y3 sitting right next to the iron may be enough to account for the result, which is:

It still runs hot. Takes about an hour to get just plain HOT -- not just warm to the touch, but uncomfortably hot to hold for any length of time. And everything close to the transformer is also hot -- mechanical filters, crystal filter can, etc.

I've checked and/or replaced what would seem to be the major

possible contributors. Current draw appears nominal. Nothing has changed. It seems simply to be the way of the beast after all, unless someone has a better suggestion .... (???) :-)

Grant  
Grant Youngman -- NQ5T  
nq5t@gte.net  
HTTP://home1.gte.net/nq5t  
Double Oak, TX (near Dallas)

-----  
Message-Id: <3.0.3.32.19980813084014.00e45ea0@terracom.net>  
Date: Thu, 13 Aug 1998 08:40:14 -0500  
To: Old Tube Radios <boatanchors@theporch.com>  
From: "Terry O'Laughlin" <terryo@wort-fm.terracom.net>  
Subject: FS: Central Elec. MM-1 RF Analyzer  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"

For Sale: Central Electronics MM-1 Multiphase RF Analyzer, serial no. B34. Displays Sine, Speech, AF Trapezoid, and RF Trapezoid. All original, works great, cosmetics are about 8.5 out of 10 (minor paint scuffs and small areas of paint wear on corners of cabinet - front panel is excellent. Only significant defect is faded silk screening on rear panel. Great addition to any vintage AM ham shack. \$125 plus shipping or trade?

73 Terry O' WB9GVB

-----  
Mime-Version: 1.0  
Date: Thu, 13 Aug 1998 08:41:52 -0600  
Message-Id: <000EAFBF.@mails.imed.com>  
From: mack@mails.imed.com (Ray Mack)  
Subject: Gassy Tubes  
To: Old Tube Radios <boatanchors@theporch.com>  
Content-Type: text/plain; charset=US-ASCII  
Content-Transfer-Encoding: 7bit  
Content-Description: cc:Mail note part

Dave Stinson asked about cooking the tubes in the oven.

I can answer the question sort of from my memory of inorganic chemistry. First I seem to remember from here or the glowbug group that old tubes do out gas over time. It comes from the gas trapped in the metal of the plate. Seems I recall hearing it was a bigger problem in power tubes.

The reason cooking would work comes from a basic principle of chemical reactions. If you raise the temperature 10 degrees C you double the reaction

rate. Raising by 180 degrees F (100 degrees C) would make the reaction take place 1000 times faster. This would make sense that just running a tube with filament voltage for a while could reactivate it. Just running it at temperature would activate the getter.

Ray Mack  
WD5IFS  
mack@mails.imed.com

-----  
Message-Id: <v03102807b1f89a2a312e@[134.53.65.12]>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
Date: Thu, 13 Aug 1998 09:49:53 -0400  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Jim Garland W8ZR <4CX250B@miavx1.acs.muohio.edu>  
Subject: Re: Inert Gas

>klaudon@pica.army.mil writes:

>

>How about Helium? It's readily available at the local X-mart in the party  
>and balloon supplies dept. I beleive that He is in the inert gas column,  
>plus your 392 would be much easier to carry :0 :) ;]

>

Sorry, but helium isn't a good choice for hermetically sealing anything, including an R392. Over time, helium will diffuse out of the radio. With an atomic weight of 4 and a nucleus consisting of 2 protons and 2 neutrons, helium is the second-lightest element (hydrogen is the lightest), but unlike hydrogen it always remains in its atomic state and doesn't form a molecule. This property, a consequence of its closed electronic shell, combined with its small size, makes it very tough to contain. Helium gas will even diffuse through the walls of a sealed glass container -- a fact well known to researchers who use it in liquid form as a low temperature coolant. This is the reason rubber helium-filled balloons so quickly deinflate.

Here's more, for you physics groupies on the List: At atmospheric pressure, helium liquifies at about 4K (-269 degrees C), just 4 degrees above absolute zero. If cooled to 2.2 K, it undergoes a phase transition into a "superfluid" -- an amazing liquid that has zero viscosity and is an infinitely good conductor of heat. Liquid helium never freezes, even at absolute zero, because the quantum mechanical motion of the atoms (known as "zero point motion") keeps them from getting close enough together to form a solid. In addition to the common form of helium, there is a rare isotope of helium, known as "helium-three") which has only 1 neutron in its nucleus, giving it an atomic weight of three. Helium-3 occurs as a byproduct of hydrogen bomb fabrication and is sold by the US military for

research purposes. Enough to blow up a balloon costs several thousand dollars.

So what should you use to seal something? Any other inert gas (argon, neon, krypton) would be a good choice, though dry nitrogen gas also works and is far cheaper.

73,

Jim Garland W8ZR

-----  
Mime-Version: 1.0  
Date: Thu, 13 Aug 1998 09:07:00 -0600  
Message-Id: <000EB076.@mails.imed.com>  
From: mack@mails.imed.com (Ray Mack)  
Subject: Ultra Modulation effects Explained (long)  
To: Old Tube Radios <boatanchors@theporch.com>  
Content-Type: text/plain; charset=US-ASCII  
Content-Transfer-Encoding: 7bit  
Content-Description: cc:Mail note part

This has been an interesting thread.

I have some insight from my communications design work.

I saw in the past day a description that this was essentially moving the signal to look like DSB partial carrier and that excessive negative would cause a 180 degree phase shift.

The first part is very close to real but not quite. What really happens is that with ultramodulation you change the average value of the carrier at the rate of the peaks of the syllables. This translates in the frequency domain to sidebands at the syllable rate which can be less than 1 Hz. On a spectrum analyser this would look like the carrier is changing value, but in fact you still have a constant carrier with some sidebands \*really\* close to the carrier. If you consider the carrier power to be all the energy within about +/- 20 Hz of the carrier to actually \*be\* the carrier, then this assumption is correct. In fact there is most likely carrier energy spread out over the +/- 20Hz region anyway due to normal phase/amplitude noise in the rig even without ultramodulation.

At the receiver, you mess up the AGC in most old radios because the design assumption is that any energy below about 50 Hz is minimal and of relatively constant amplitude. Any changes in this value are due to the fading that the AGC is trying to track. When you add ultramodulation the AGC does exactly what it is supposed to do: it

raises and lowers the gain following the syllabic changes. The way to solve the problem at the receiver is to lengthen the time constant to many seconds. Of course, then rapid fades blow away the signal.

The assertion that greater than 100% negative modulation would cause a phase reversal seems unlikely. Such a reversal would cause some distortion, but not much because it is phase distortion. This phase reversal would require that you use a 4 quadrant multiplier (like the diode DBM's) to generate the phase reversal. I would guess that all rigs that do ultramodulation on the output amplifiers are 2 quadrant multipliers. That means that when the modulation tries to go negative you get clipping. That causes square wave type generation and \*THAT\* causes excessive modulation harmonics and splatter (amplitude rather than phase distortion).

Given the likelihood that the receiver's AGC will pump on the syllabic rate of the sidebands, I doubt that the system as actually implemented would really give much increase in talk power.

Ray Mack  
WD5IFS  
mack@mails.imed.com

-----  
Message-ID: <01BDC6AD.04A66EE0@esieb.gmsiworld.com>  
From: Ed Sieb <esieb@gmsiworld.com>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: RE: what is this receiver??  
Date: Thu, 13 Aug 1998 11:24:59 -0400  
MIME-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
Content-Transfer-Encoding: 7bit

On Thursday, August 13, 1998 1:23 AM, Kargokult@aol.com wrote:

\* it. back has only a tag that sez licensed to use patents of ITT.

This suggests that it might be a species of ITT-Mackay-Marine receiver. That'd be a good place to start your research.

Happy hunting! :-)  
Ed, VA3ES

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Message-ID: <07E473510AF0D111ADFA00A0C9B4205226F79C@mail1.pica.army.mil>

From: "Laudon, Kenneth (Kalman) A." <klaudon@pica.army.mil>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: RE: Inert Gas  
Date: Thu, 13 Aug 1998 11:30:20 -0400  
MIME-Version: 1.0  
Content-Type: text/plain

Jim Garland, W8ZR explained why helium's high diffusibility, due to small, monoatomic size and low reactivity (that's why it's called inert) would render it ineffective as an inert fill gas.

Thanks for the xlnr discussion, Jim. However, it was Chuck, kb4new, cswiger@widomaker.com, who suggested helium. The way you edited his message, it looks as if I suggested helium. No harm done. As it happens, I was actually thinking of helium, since it is widely available (for balloon filling). CO2 is also widely available at beer/soft drink distributors, for bar dispenser systems (and keg parties!).

However, whatever the choice of purge, even if it's just compressed air, the gas should definitely be clean (i.e., oil free) and dry. Unless one has access to clean dry nitrogen, and given that CO2 has been indicted as corrosive (it is REALLY worse than air??), perhaps the best thing to use is compressed air, but ONLY from an oil-free source. Probably the air supply that scuba places fill tanks with would be fine. Ideally, they would use a precooler with knockout drum/water trap to dry the air, on the input to the oil-free compressor. Oil free AND dry air would be fine for radio purging. Anyone know what scuba or emergency eqpt. places do?

Medical grade gasses (like NO, remember, it's a joke!) would be clean and dry.

Welding/industrial quality gasses are NOT oil free and should not be put into electronics.

73 de Kalman W2ES

> -----

> From: Jim Garland W8ZR[SMTP:4CX250B@miavx1.acs.muohio.edu]  
> Reply To: 4CX250B@miavx1.acs.muohio.edu  
> Sent: Thursday, August 13, 1998 9:49 AM  
> To: Old Tube Radios  
> Subject: Re: Inert Gas

>

> >klaudon@pica.army.mil writes:

> >

> >How about Helium? It's readily available at the local X-mart in the  
> party



> >and balloon supplies dept. I beleive that He is in the inert gas  
> column,  
> >plus your 392 would be much easier to carry :0 :) ;]  
> >  
>  
> Sorry, but helium isn't a good choice for hermetically sealing  
> anything,  
> including an R392. Over time, helium will diffuse out of the radio.  
> With  
>  
> So what should you use to seal something? Any other inert gas (argon,  
> neon,  
> krypton) would be a good choice, though dry nitrogen gas also works  
> and is  
> far cheaper.  
>  
> 73,  
>  
> Jim Garland W8ZR  
>

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End of BOATANCHORS Digest 2169  
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